THE UNIVERSITY OF CHICAGO

ROUND TABLE

What about Science Legislation?

A Radio Discussion by ANDREW IVY
EDWARD LEVI *and* HAROLD UREY

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Around the Round Table . . . .

ANDREW CONWAY IVY, head of the division of physiology and pharmacology of Northwestern University Medical School, was born in Farmington, Missouri. Upon graduating from the State Normal School in Cape Girardeau, he came to the University of Chicago, where he received the degree of Doctor of Philosophy in 1918. He took his medical training at Rush Medical College and interned at Mercy and Augustana hospitals in Chicago. In 1917 Dr. Ivy returned to the University of Chicago, this time as instructor in physiology, and remained there as associate professor until 1925. During World War II he served as director of the Naval Medical Research Institute. He is an active member of the American Medical Association, of which he was chairman of the section on physiology and pathology in 1931, the Illinois and Chicago Medical societies.

EDWARD H. LEVI, professor of law in the Law School of the University of Chicago, has recently returned to the University after several years in special government service. He did his undergraduate work at the University of Chicago and also received his law degree from the University of Chicago in 1935. Professor Levi studied at the Yale School of Law and was granted a J.S.D. degree in 1937. He has been connected with the University of Chicago Law School since 1936. In 1940 he went into government service and served as a special assistant to the Attorney-General and as the first assistant in the Antitrust Division. He is a contributor to *War and the Law* (1945).

HAROLD C. UREY, recently appointed distinguished service professor of chemistry at the University of Chicago, has specialized in the study of atoms and molecules and has made many outstanding contributions to the knowledge of this particular field. He is the discoverer of the hydrogen atom of atomic weight two and is the holder of many awards and medals for his services, such as the Nobel Prize in Chemistry for 1934, the Willard Gibbs Medal from the Chicago Section of the American Chemical Society, 1934, the Davy medal of the Royal Society of London in 1940, and the Franklin medal from the Franklin Institute in 1943. He is a member of the American Association for the Advancement of Science, the American Chemistry Society, the National Academy of Sciences, the Royal Swedish Academy of Science, Academie Royale des Sciences, des Lettres et des Beaux Arts de Belgique, and many other associations both here and abroad. He has contributed widely to scientific journals and is the author (with A. E. Ruark) of *Atoms, Molecules and Quanta* (1930).

What about Science Legislation?

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MR. LEVI: At the present time a number of controversial bills are pending in the Congress of the United States whether to control or to subsidize science. These bills have been heatedly debated both in Congress and among scientific groups. Why is there this tremendous and unprecedented interest in science legislation?

DR. IVY: I think that it is probably because of the remarkable contributions of science to the war effort. There are, for example, the contributions of rockets, radar, the atomic bomb. Then, in the medical sciences, there are penicillin, the use of blood plasma, the sulfa drugs, DDT, and the means of malaria control.

MR. LEVI: That is a list of good things that have been done by science during the war. What about the atomic bomb?

MR. UREY: It is true that during the war a great deal of very good development science was done which aided us greatly in the war effort. However, during all this time there was practically no development at all of what I would call fundamental science. Before the war the United States was weak on fundamental science and strong on the applications of science; during the war we have become even weaker in this respect, since we have not trained students during this time.

MR. LEVI: Is it not also true that we discovered during the war that cartel restrictions and the applications of our own

patent system had worked so that we were not so far advanced in science as we thought?

MR. UREY: That is something which I do not know so well first hand, but I am quite sure that breaking down during the war the restrictions which existed between our industrial companies did result in a greatly increased tempo for war work. Whether this can be done in peacetime or not is somewhat difficult to say.

MR. LEVI: I am sure that it will be a great shock to the American people to be told that we are not foremost in basic scientific work.

MR. UREY: I can give some illustrations which show very clearly that this is the case. Perhaps the most outstanding example is the atomic-bomb development itself. The fundamental discoveries upon which the atomic bomb is based were made mostly in Europe before the war. There was the discovery of atomic fission by Otto Hahn, in Germany; the discovery of the neutron itself by Sir James Chadwick; the discovery of artificial radioactivity by Professor Fermi, who was then in Italy. As a matter of fact, if we go back fifty years, there is the discovery of radioactivity itself. This illustrates very well how we have drawn from Europe in the past for the development of fundamental science, even though we have been very capable when it came to developing and adapting science to practical uses.

MR. LEVI: Of course, the development and adaptation depend upon basic science in the first place.

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DR. IVY: We should be stronger in basic science in the medical field also. For example, penicillin was a basic-science discovery made in Britain; the sulfa drugs were developed in Germany. Our contributions to the basic sciences must be markedly facilitated in this country if we are to do our share in contributing to the world's knowledge of basic science.

MR. UREY: I myself think that the reason that this science legislation is coming up, in the way that it is now, is due to a realization on the part of Congress and the people of the United States that we have not been getting as much out of our science as we might.

MR. LEVI: Do I understand you to say that the atomic bomb is mostly, as far as basic science is concerned, a European development and that the legislation now pending to keep it an American secret is rather quixotic, because it is a European development?

MR. UREY: There has been a lot of discussion about this secret of the atomic bomb. There is no fundamental decisive secret of the atomic bomb. There are a great many details which are not negligible and which at present we only know; but we cannot keep this information. I am sure that any other country which attempts to develop an atomic bomb will be able to uncover all the things which we have discovered and perhaps add some better ones of their own.

DR. IVY: That is true in every field of science, is it not?

MR. UREY: It seems so to me. I am only presenting this as an illustration of the situation. We could say the same thing about almost any field of science that there is.

MR. LEVI: Then what about the May-Johnson Bill, which was intended to keep this as an American secret?

MR. UREY: That was, in my opinion, a hysterical bill. It was

drawn up under wartime conditions; and I do not wish to criticize the people that drew up that bill. Perhaps I also would have drawn up such a bill at that time. But it is not possible to keep the atomic bomb secret, as I said before. The secrecy provisions of the May-Johnson Bill were fantastic, and the penalties were equally so. Probably during the past few months the people of the United States have come to realize that we cannot keep the secret of the bomb indefinitely; and perhaps they realize that it is not wise to do so.

DR. IVY: The basic ethic of science itself is against secrecy generally. Scientists cannot agree to a principle of keeping knowledge secret. It would stop the progress of science—not only in the physical sciences but also in the medical sciences.

MR. LEVI: Of course, one of the difficulties about the May-Johnson Bill, as I understand it, was that the scientists were not consulted before it was gotten up and introduced. In other words it was a system, which was introduced without consultation with the scientists generally, to regulate science in an important field.

DR. IVY: But have the atomic scientists not been heard recently?

MR. UREY: Very much so! As a matter of fact, not only was the May-Johnson Bill drawn up in secret, but an attempt was made to pressure it through Congress without letting Congress know what it was legislating about. That has been very much corrected now by the establishment of the special Senate committee under Senator McMahon as chairman. This committee has been holding very satisfactory and open discussion of the whole subject.[1]

[1] Hearings on the May-Johnson Bill have been conducted by a special Senate committee, including Senators McMahon (chairman), Johnson, Tydings, Vandenberg, Hart, Millikin, Austin, Hickenlooper, Connally, Russell, and Byrd. See the reports of these hearings: "Internationalize Atomic Energy!"

MR. LEVI: Of course, a great deal of credit must go to the atomic scientists, particularly the Federation of Atomic Scientists, who have done so much to make known the facts about atomic energy and atomic power and have now, as I understand it, worked very well in cooperation with Senator McMahon's committee. I think that we all can be proud both of what the scientists have done and what, in this instance, the committee of the Senate has been doing.

MR. UREY: As one of the scientists who has been interested in that situation, I should like to say that we have received the best cooperation from this Senate committee. They have been willing to listen to all the scientists and all the varying points of view which we could present.

MR. LEVI: Senator McMahon has just introduced a new bill to control atomic power. How does that line up? How does it compare with the May-Johnson Bill?

MR. UREY: I have simply read it through quickly; but I would say that it is an enormous improvement on the May-Johnson Bill. It seems to me that we now have a very great reason to believe that good legislation in regard to atomic energy can be enacted by this Congress.

MR. LEVI: I understand that there is going to be a ROUND TABLE on January 6 which will deal with atomic-power legislation, probably from the international point of view. Of course, I suppose that we agree now that any domestic legislation must be in harmony with any international treaty or agreement which can be worked out. Possibly, since there is going to be a ROUND TABLE devoted exclusively to the atomic bomb, we ought to take a look at the other kind of science legislation which is now being considered.

New Republic, October 29, 1945; "Terribly More Terrible," *Time*, October 29, 1945; and "Can't Keep It with You," *Newsweek*, October 29, 1945.

DR. IVY: There are several bills which pertain to research and education. One of them refers to the National Research Foundation; the other refers to the National Science Foundation. These bills propose to subsidize research in the field of science and to develop discoveries which are made. They also propose to establish fellowships for the purpose of training scientists.[2]

[2] Several bills have been proposed to set up facilities for government assistance in the promotion of scientific development. The Magnuson Bill proposes the establishment of a National Research Foundation which would promote a national policy for scientific research and education. This bill further authorizes the support of research relating to national defense and the basic sciences.

The Kilgore-Pepper-Johnson Bill proposes the establishment of a National Science Foundation which would support research relative to national defense, medicine, and the basic sciences. This bill provides for the support of such research in nongovernmental laboratories and makes provision for the integration of the over-all program of government-financed research.

On December 21, 1945, as a result of hearings on these bills, a Senate subcommittee on war mobilization submitted a preliminary report and suggestions for revision of the earlier proposals into one new bill. This committee included Senators Thomas, Johnson, Murray, and Kilgore. The major recommendations embodied in the new proposal include (see National Science Foundation, *Preliminary Report from the Subcommittee on War Mobilization to the Senate Committee on Military Affairs* [Washington: Government Printing Office, December 21, 1945]):

"1. The bill provides for the creation of a National Science Foundation to support (*a*) research for national defense, (*b*) health and medical research, (*c*) fundamental research without arbitrary exclusion of any field of science, and with specific provisions for the mathematical and physical, biological, social, and engineering sciences.

"In recommending that the program of the Foundation include the social sciences, your subcommittee is implementing the recommendations of the President and the majority of the witnesses who testified on this subject. Not a single witness opposed the Federal support of the social sciences. A minority urged that such support be deferred or provided in a separate agency.

"2. The bill provides for support by the Foundation of training of scientific personnel through a program of undergraduate scholarships and graduate and post-doctoral fellowships. Your subcommittee is convinced this program is necessary to meet a serious deficit in the Nation's scientific personnel.

"3. The bill would enact a basic policy of full publication and dedication to the public of all the findings and results of federally financed research. The bill provides for such exceptions to this basic policy as are necessary to protect the rights of private organizations which participate in programs of Federal research and development. The soundness of this policy was clearly demonstrated in the testimony of Commissioner Ooms of the United States Patent Office.

"4. The bill provides for an organizational structure for the Foundation (*a*) which will permit the maximum participation by the Nation's scientists in for-

MR. LEVI: Why should we subsidize science? Is it because education is a good thing and the federal government ought to assist?

DR. IVY: There are several reasons. One is that, as we pointed out before, basic science is quite well neglected in this country.

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mulating the Foundation's program, both as full-time Government employees and as part-time consultants, and (*b*) which will fix responsibility for the execution of the program in officials directly responsible to the President and to the Congress.

"5. The bill provides for the safeguarding of scientific freedom and initiative—

"(*a*) By inclusion of specific language showing the intent of Congress that scientific freedom and initiative be safeguarded;

"(*b*) By a further specific provision that all officers and employees of the Foundation be selected on a nonpolitical basis, solely with regard to their capacity to carry out their duties;

"(*c*) By providing for a 'goldfish bowl' type of operation, so that the work of the Foundation will be under the constant scrutiny of the public, and particularly, of the Nation's scientists.

"The bill provides a system of part-time scientific boards and committees with access to the President, Congress, and the public, which can both provide guidance and serve as a check on the full-time administrators.

"(*d*) By placing final responsibility on full-time Government officials appointed by the President and confirmed by the Senate, to minimize the possibility of the Foundation becoming the tool of any special interest group.

"(*e*) By encouraging widespread initiative through an automatic formula for the distribution of a minimum proportion of the total research funds among the several States.

"6. The bill provides authority for the Foundation to participate in international scientific endeavors. This includes financial aid to recognized national scientific organizations as necessary to assure the adequate representation of American scientists in international scientific congresses.

"7. The bill provides for the creation of an Interdepartmental Science Committee to advise the Foundation and other Federal scientific agencies on the better coordination and improvement of the federally supported programs of scientific research.

"The new bill includes special provisions which the subcommittee believes are required because of the nature of the scientific activity of the Foundation. These include the authority to employ certain expert personnel without reference to the classification procedures of the civil-service laws; defray the cost of publication in scientific journals of the findings growing out of federally sponsored research; make contracts for research without advertising for bids; expend annual appropriations over a five-year period so long-term scientific projects may be planned. . . . . " ("Recommendations," National Science Foundation, *op. cit.*).

Further, in view of the increase in taxes, in view of the decrease in income and endowment, in view of a decrease in anticipation of large endowments to privately endowed institutions, we must have some sort of support for basic science; and the government, it would seem to me, is going to have to do this, just as England has had to do it since the last war.

MR. LEVI: Of course, this is not the first time that the federal government has tried to assist science. I suppose that the patent system is an attempt to assist scientific development at least. The notion now that we must directly subsidize science is some indication at least that the patent system has not worked sufficiently to encourage scientific developments.

MR. UREY: I suppose that it does help some to encourage scientific developments, but apparently we must conclude at the present time that it is not sufficient. Probably we should note, at this point, that universities and pure scientific research foundations have not been particularly interested in patents and have not drawn their income from patents. As Dr. Ivy says, we have found that we just do not have sufficient funds from private sources to continue work of this kind.

MR. LEVI: This other kind of legislation—this so-called National Science Foundation legislation—as I understand it, will just make government funds available for basic scientific work. Is that correct? Is that the way that it is going to operate? What will it actually do?

DR. IVY: That is correct. As I understand the scientific legislation, it is concerned principally in implementing the Office of Scientific and Research Development, which was established during the war to apply discoveries in science for use in the war effort.[3]

[3] The Office of Scientific Research and Development was headed by Dr. Vannevar Bush as a wartime agency for coordinating scientific research and development.

Mr. Levi: Of course, the Office of Scientific and Research Development was a cooperative governmentally organized team of scientists who were doing—shall we say?—basic scientific work.

Mr. Urey: I would say that they were rather doing mostly developmental and application work. Most of the things on which we worked were things that anyone could see would be worth while to pursue for war purposes. Practically no fundamental science was worked on by the OSRD; and practically no fundamental science was pursued during all the war years.

Mr. Levi: Would you say that the proposed legislation is designed to perpetuate the Office of Scientific and Research Development?

Mr. Urey: No, I would not say so. I do not think that it has that objective. It is rather a thing which is growing out of the Office of Scientific Research and Development.

Dr. Ivy: I agree with that. The work under the OSRD demonstrated how scientists can get together in a cooperative way to develop known facts. However, we need a lot of individual effort in science and particularly in the field of basic science, where an individual gets his own idea and should be given an opportunity to develop it. That is really the way in which we make progress in the field of basic science. Then, when it comes to development, we can all pitch in together in a cooperative enterprise.

Mr. Levi: How much money is going to be spent by this foundation? Something like the seven hundred million dollars a year which we have spent during the war on what has been called scientific research?

Mr. Urey: I would not think so. Dr. Bush, in his *Science, the Endless Frontier*,[4] proposes sums that run up to approximately a

[4] Vannevar Bush, *Science, the Endless Frontier* (Washington: United States Government Printing Office, 1945).

hundred million dollars, although he proposes to start with somewhat smaller sums than that. I would say that that would be a reasonable amount of money to spend on the fundamental scientific research. I think that a national science research foundation should concern itself with fundamental science while industrial companies continue to finance a great deal of the development of these findings through their own research, as they have in the past.

Mr. Levi: Will this bill set up a governmental laboratory? Will the government finance its own research?

Mr. Urey: I understand not.

Dr. Ivy: That is not proposed at all. Everyone has been against that.

Mr. Levi: The research would be done by universities and by profit-making institutions, and all the government will do will be to give out some money?

Dr. Ivy: Contracts for research and development could be made with any institution.

Mr. Levi: Will not such legislation further enormously the gap between the social sciences and the natural sciences? Will it not mean that we will be less able to govern ourselves and more able to invent such things as the atomic bomb, which, in turn, make development that much more difficult?

Dr. Ivy: That is one of the controversial points in this legislation. As a matter of fact, there are three controversial points. One pertains to the type of board of control; the second as to whether or not the social sciences should be included with the natural sciences; and, third, whether or not patent stipulation should be introduced into the legislation.

Mr. Levi: I take it that all the scientists are agreed, then, that it is a good thing to give out the money for science.

Mr. Urey: Oh, I think that almost anyone would agree with that.

Dr. Ivy: Might I say, out of the one hundred and seventeen persons who testified before the committee, all were in favor of government support of research and basic science, with the exception of one.

Mr. Urey: It seems to me that it is necessary to make some sort of provision for the social sciences for the reasons which Levi has mentioned.

Mr. Levi: I do not understand the argument against including them. In fact, I am a little startled to find that there is a controversy about it.

Dr. Ivy: This is my argument against it. Are we going to pass legislation to improve general education throughout the country, or are we concerned only with passing legislation to improve basic science? As a result of the war effort, we are interested primarily in increasing research in the natural sciences. I am not against increasing investigation in the social sciences at all, but I think that that should be done under a separate bill. If we get the "isms" of the social scientists mixed up with natural science, then we will be looking for trouble in the field of the natural sciences.

Mr. Levi: Of course, they are already mixed up, because I notice that Mr. Bush, in his work entitled *Science, the Endless Frontier*, says that we ought to have the National Science Research Foundation, because that will contribute to full employment and will make possible health and security for this country.

Those are all controversial problems when one looks at them beyond just the first surface. Unless we have social science developments, it is not going to help us very much to have the

basic scientific research, and certainly not the application research.

Mr. Urey: It seems to me that Dr. Ivy's suggestion that there ought to be a separate bill to cover all these other subjects is not a bad suggestion at all. But the whole question of including the social sciences turns on the question of whether we can secure such a bill at the present time. I seriously doubt it. There is an aura around the natural sciences at the present time. If we give support to the natural sciences and not to the social sciences, we will merely make the discrepancy between them greater in the future than in the past.

Mr. Levi: I want to say, in regard to that aura around the scientists, that I do think that they have used it in a way of which all of us can be proud in sponsoring good legislation on atomic power. They have been very conscious of their social obligations as well as their purely scientific obligations.

Dr. Ivy: But if we are going to include the social sciences in this legislation, we should not leave out any department of education or any department in the university. It should be a general university education bill.

Mr. Levi: It is a question of what should come first. To pass legislation now dealing with natural science research, before we have any other legislation, is the kind of statement that the most important thing we can do now is to encourage the development of the natural sciences, and I don't believe that anybody looking at the state of the world today can say that.

Dr. Ivy: We know that the OSRD type of setup has worked quite well. Since this is an experiment in legislation, if we simply carry over the OSRD development for the present time, we can determine then whether or not that will be successful. Later the social sciences can be added.

Mr. Levi: Of course, under this legislation, as I understand it, grants will be given for scholarships and fellowships. But we do not want to have all the bright young men and women going into the natural sciences because it pays them better or because that is the only way they can afford an education. That might be one of the serious consequences of not including the social sciences, or, for that matter, the humanities in this bill.

Mr. Urey: It seems to me that Dr. Ivy has a very good point. But in order to be consistent about it, those people who believe that we should have a separate foundation for the social sciences should do something about the matter. I do not believe that we should neglect it. Certainly the natural scientists should be interested in this country as a whole, and I do not think it would be amiss if they did something to try to secure such legislation. So far as I know, no one has attempted it. The furthest we have gone is to suggest that the social sciences be included in this one science bill; and some people have supported that, and some have opposed it. But, really, we ought to do something about the matter if we think that a separate bill should be produced.

Mr. Levi: What is the second controversy about the administrative setup?

Dr. Ivy: There are several general ideas. One is for the President to appoint a group of scientists who will elect their own administrator who will be subject to the policy and wishes of the board.

Mr. Levi: Would it be a board of full-time government officials who happen to be scientists, or will it be a board of scientists who give part time to their governmental duties?

Dr. Ivy: It will be part time, because I believe that on a part-time basis one can persuade more able men to serve on the board.

The other scheme or plan of organization is that the President appoint an administrator and members of the board but that the board would be subservient to the administrator.

MR. LEVI: I suppose that most of the scientists prefer to run it themselves, acting as government officials on a part-time basis.

DR. IVY: That is natural, because the scientists do not want their work to get into the field of politics where political pressures would be brought upon them regarding how the money should be expended for research.

MR. LEVI: Of course, any group of men who are going to be able to take a hundred million dollars out of the federal treasury every year, it seems to me, are in politics.

MR. UREY: Yes, I am not so sure at all that scientists are so pure white when it comes to matters of political manipulation. They are quite as capable of doing that sort of thing as any other faction of the population. Perhaps we might note that, in the experience of scientists, some of the national scientific societies are not run in a very democratic fashion. There is thus a real danger that if this part-time commission has control of these funds, they will operate it, perhaps, to the great advantage of certain groups in the country and to the disadvantage of others. I do not see any way for us to protest if that is done. Somebody who is president of a university does not care whether I like the way he runs the thing or not, but elected officials or appointed officials from the government of the United States are likely to be much more receptive to criticisms from outside.

MR. LEVI: And how can they contend with this wonderful aura you were talking about which surrounds the scientists? One cannot criticize an atomic-bomb scientist today with any hope of success. They are just too popular. But most of us lay-

men still have a feeling that there are scientific cliques—that there is a little bit of something like trade-unionism. As a matter of fact, for example, we are not quite sure of the American Medical Association. We think that it may be interested in its own association activities and not always interested in the public weal.

Dr. Ivy: All those criticisms can be taken care of by requiring the board to report annually to Congress and by having the report subject to an open hearing at which acts of the board can be reviewed and criticized.

Mr. Urey: One of the difficulties of that is that the board is not going to criticize itself. Its report which goes to Congress will be a very nice-sounding report. What is important is that we establish some way by which independent criticisms of the way in which things are run can be effected.

Mr. Levi: I understand that there is another problem in the question of patents. As I understand it, a great many of the scientists want to be able to take this money (for instance, the Bell Telephone Company, I understand, got about seventy million dollars) and then to take out private patents which exclude others or to charge royalties on the results of the use of this money.

Dr. Ivy: That is the third point of controversy. I join a large number of scientists in the position that the patents should be subject to the control of the board and that patent legislation should not be introduced into this bill. Patent legislation, I believe, is a separate problem and should be taken care of by a separate bill.

Mr. Levi: The problem of patent legislation might be put this way, I believe. The government might permit a private contractor to build a public highway; and, in order to get paid

for it, the government might permit the private contractor to charge a toll. It is his money, for he is putting up his own money, and he will get paid for it by having this as a toll road. But if the government itself is going to pay for it, it seems to me, then, rather strange to permit the contractor, in addition, to charge a toll.

In summary of our discussion today, I would say that there are two points on which we have agreed. The first of these is that legislation to control atomic power must provide for a minimum of secrecy, must permit free scientific research, and must not be inconsistent with the policy of international collaboration. The May-Johnson Bill would not have accomplished these aims, but we believe that the McMahon Bill, as a result of careful hearings, will give us good cause for optimism.

Our second point is that we are all in favor of legislation which will provide for federal grants-in-aid of scientific research. We believe that the defense, the independence, and the well-being of this country require a greater amount of basic scientific research than would be possible without federal aid.

If aid to science is given, there are three subsidiary problems upon which we have not agreed: (1) Shall the social sciences be included? (2) Shall a part-time board of scientists determine how the money is to spent? (3) Shall patents on products or processes developed as a result of governmental research be permitted? Urey and I favor the inclusion of the social sciences and are opposed to administration by a part-time board of scientists,

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but we believe some patent control measure must be included. Dr. Ivy believes that the patent problem should be postponed; that the social sciences should be taken care of in a separate bill; and that the administration of the National Foundation should be placed in the hands of a part-time board of scientists. Despite our differences of opinion, we believe that the careful hearings now being conducted by the Senate committee studying national science legislation and the discussions now being carried on by scientific groups will make possible suitable and proper compromises in legislation now pending in order to further and to make generally available to our people the benefits of science.

What Do *You* Think?

1. What do you think of the proposal to have the government subsidize scientific work? What is the difference between fundamental science and applied science?

2. What success will attend the efforts to keep scientific work in atomic physics secret? What are the advantages and disadvantages of such secrecy? Why must the basic tenet of science be the free exchange of information?

3. What were the merits of the May-Johnson Bill? Should scientists have been consulted before it was introduced? To what degree can scientific work be subjected to military control and remain able to progress?

4. Should the government have exclusive rights to any patents resulting from government-sponsored research? Should a scientist working on a government grant in the laboratory of a private corporation have the usual patent rights? Should legislation for science be the vehicles for patent reforms?

5. Should the government make grants for work in the social sciences? What would be the effect if government money were poured into the natural sciences and very little were devoted to the social sciences?

6. How do you think that the results of scientific research can be best devoted to the public good? What is the legitimate role of government in the promotion of scientific investigation? Discuss in relation to the type of program you favor.

More on This Topic

"Atomic Scientists Speak Up," *Life*, October 25, 1945. *Scientists' declaration that there is no secrecy in the atomic bomb and no defense against it.*

BUSH, VANNEVAR. "Beyond the Atomic Bomb," supplement to *Fortune*, September, 1945.

———. "Builders," *Atlantic*, May, 1945.

———. *Science, the Endless Frontier.* Washington: United States Government Printing Office, 1945. *The director of the Office of Scientific Research and Development's report to the President.*

"The Challenge of the Atomic Bomb," supplement to the *Nation*, December 22, 1945. *A series of articles by leading scientists, educators, and observers of American democracy.*

COOKE, M. L. "Congress Grapples with Science," *New Republic*, July 30, 1945.

DODDS, H. W. "New Responsibilities of Science," *Vital Speeches*, November 1, 1945.

"Government's Role in Science: A Key to World Leadership," *United States News*, October 19, 1945.

"Internationalize Atomic Energy!" *New Republic*, October 29, 1945. *A critizism of the May-Johnson Bill.*

SHAPLEY, HARLOW. "Status Quo or Pioneer?" *Harper's*, October, 1945.

SHOTWELL, J. T. "Our Endless Frontier," *Survey Graphic*, November, 1945.

TRUMAN, HARRY S. "Atomic Energy," *Vital Speeches*, October 15, 1945. *President Truman's message to Congress on the domestic and international control of atomic energy.*

"Two v. the Atom," *Time*, November 19, 1945. *A report of the international aspects of the atomic bomb.*

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Augusta, Me.	WRDO	1400	Miami, Fla.	WIOD	610
Bluefield, W.Va.	WHIS	1440	Mobile, Ala.	WALA	1410
Bristol, Tenn.–Va.	WOPI	1490	New York, N.Y.	WEAF	660
Buffalo, N.Y.	WBEN	930	Norfolk, Va.	WTAR	790
Charleston, S.C.	WTMA	1250	Providence, R.I.	WJAR	920
Charlotte, N.C.	WSOC	1240	Raleigh, N.C.	WPTF	680
Chattanooga, Tenn.	WAPO	1150	Reading, Pa.	WRAW	1340
Cleveland, Ohio	WTAM	1100	Tampa, Fla.	WFLA	970
Columbia, S.C.	WIS	560	Trenton, N.J.	WTTM	920
Cumberland, Md.	WTBO	1450	Washington, D.C.	WRC	980
Elmira, N.Y.	WENY	1230	Wilkes-Barre, Pa.	WBRE	1340
Erie, Pa.	WERC	1230	Wilmington, Del.	WDEL	1150
Greenwood, S.C.	WCRS	1450	Winston-Salem, N.C.	WSJS	600
Harrisburg, Pa.	WKBO	1230			

12:30 P.M. CENTRAL STANDARD TIME

Bismarck, N.D.	KFYR	550	Monroe, La.	KNOE	1450
Chicago, Ill.	WMAQ	670	Minneapolis and St. Paul, Minn.	KSTP	1500
Des Moines, Iowa	WHO	1040	Pittsburg, Kan.	KOAM	810
Duluth, Minn., and Superior, Wis.	WEBC	1320	Saginaw, Mich.	WSAM	1400
Elkhart, Ind.	WTRC	1340	Shreveport, La.	KTBS	1480
Evansville, Ind.	WGBF	1280	Springfield, Mo.	KGBX	1260
Fargo, N.D.	WDAY	970	Terre Haute, Ind.	WBOW	1230
Grand Rapids, Mich.	WOOD	1300	Virginia, Minn.	WHLB	1400
Hibbing, Minn.	WMFG	1240	Wichita, Kan.	KANS	1240
La Crosse, Wis.	WKBH	1410	Zanesville, Ohio	WHIZ	1240
Lima, Ohio	WLOK	1240			

11:30 A.M. MOUNTAIN STANDARD TIME

Albuquerque, N.M.	KOB	770	Helena, Mont.	KPFA	1240
Boise, Idaho	KIDO	1380	Phoenix, Ariz.	KTAR	620
Bozeman, Mont.	KRBM	1450	Prescott, Ariz.	KYCA	1490
Butte, Mont.	KGIR	1370	Salt Lake City, Utah	KDYL	1320
Denver, Colo.	KOA	850	Tucson, Ariz.	KVOA	1290
Globe, Ariz.	KWJB	1240			

10:30 A.M. PACIFIC STANDARD TIME

Fresno, Calif.	KMJ	580	Sacramento, Calif.	KCRA	1340
Medford, Ore.	KMED	1440	San Diego, Calif.	KFSD	600
Portland, Ore.	KGW	620	Seattle, Wash.	KOMO	1000
Reno, Nev.	KOH	630	Spokane, Wash.	KHQ	590

STATIONS CARRYING ROUND TABLE BY DELAYED BROADCAST

Kansas City, Mo. (Tuesday, 10:30 P.M., CST)	WDAF	610	San Francisco, Calif. (Sunday, 9:00 A.M., PST)	KPO	680
Los Angeles, Calif. (Sunday, 9:00 A.M., PST)	KFI	640	St. Cloud, Minn. (Saturday, 4:00 P.M., CST)	KFAM	1450
Mankato, Minn. (Thursday, 10:00 P.M., CST)	KYSM	1230	Twin Falls, Idaho (Friday, 10:30 P.M., MST)	KTFI	1270
Rochester, Minn. (Monday, 9:00 P.M., CST)	KROC	1340	Iowa City, Iowa	WSUI	910